Federal Democratic Republic of Ethiopia

☞ EDICT OF GOVERNMENT ☜

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ET 661 (2001) (English): BARLEY MALT-DETERMINATION OF VISCOSITY OF WORT

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ETHIOPIAN
STNADRAD

ES 661:2001
(Reaffirmed:2012)

First edition

Pulses — Determination of viscosity of wort

ICS: 67.060
Published by Ethiopian Standards Agency
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Foreword

This Ethiopian Standard has been prepared under the direction of the Technical Committee for Cereals, pulses and derived products (TC 11) and published by the Ethiopian Standards Agency (ESA).

The standard is a reaffirmation for reprint of the Ethiopian Standard ES 661:2001, Barley malt - Determination of viscosity of wort, with some editorial changes without altering the technical contents in the former text.

Barley malt — Determination of viscosity of wort

1 Scope

This Ethiopian Standard specifies the method for the determination of viscosity of wort.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this Ethiopian Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this Ethiopian Standard are encouraged to investigate the possibility of applying the most recent editions of the Ethiopian Standards indicated below. Registers of currently valid standards are maintained in the Quality and Standards Authority of Ethiopia.

ES ISO 6644:2001, *Cereals and milled cereal products-Automatic sampling by mechanical means.*

ES ISO 13690:2001, *Cereals, pulses and milled products – Sampling of static batches.*

3 Apparatus

The following apparatus shall be used :

- Falling ball viscometer

4 Sampling

Sampling of barley malt shall be taken in accordance with ES ISO 13690 or ES ISO 6644.

5 Procedure

5.1 The falling ball viscosimeter in a jacket room as shown in the attached figure, shall be cleaned, dried and fixed up with its water level adjusted. The jacket room around the measuring tube, shall be filled with water and its temperature controlled at 20° C. Then about 40 ml of wort free of air bubbles shall be poured into the measuring tube up to 20 mm below the rim of the tube. The falling ball shall be placed in the measuring tube and closed with the cover.

5.2 The wort shall be left for 20 to 30 minutes before measuring of falling time of the ball. Then the measuring tube shall be locked into its normal position by snapping the locking pin. By unlocking and turning the measuring tube upside down the ball will get into its starting position.

5.3 The falling time of the ball moving from the ring mark A to the ring mark B shall be determined using a stop watch. The time period shall start when the lower periphery of the ball touches the ring mark A, which being sighted must appear as a straight line. The falling time shall end when lower periphery of the ball touches the ring mark B, which again must appear as a straight line. The measuring tube shall be turned to 180°C again and the ball shall return to its starting position. The falling time shall be taken as mean value of several falling time values.

NOTE - When measuring the viscosity of wort, the measurement time should take place within 60 minutes of the beginning of filtration.

6 Expression of Results

Viscosity of wort shall be calculated as follows:

DB (mPa per second) = t (DB-DL) F

Where,

t *is the falling time per, second,*

DB *is the density of the ball in* g/cm^3

DL *is the density of the liquid in* g/cm^3

F *is ball constant* $\frac{mPa/cm^3}{g}$ *, and*

mPa *is the millipascal unit*

7 Test result

The test report shall include the following information

a) reference to this standard;

b) the results and method of expression used, and all information necessary for complete identification of the sample ; and

c) any unusual features noted during determination

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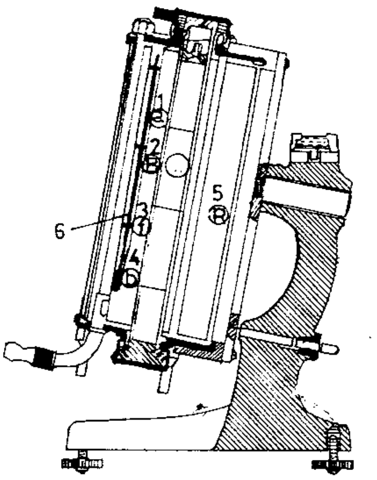

1.a Measurment starting point
2.B Ball
3.F Fall Cylinder
4.b Measurment end point
5.R Water cover
6.T Thermometer

Figure Showing Viscosmeter Apparatus

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Ethiopian Standards Agency

Organization and Objectives

The Ethiopian Standards Agency (ESA) is the national standards body of Ethiopia established in 2010 based on regulation No. 193/2010.ESA is established due to the restructuring of Quality and Standards Authority of Ethiopia (QSAE) which was established in 1970.

ESA's objectives are:-

- Develop Ethiopian standards and establish a system that enable to check weather goods and services are in compliance with the required standards,
- Facilitate the country's technology transfer through the use of standards,
- Develop national standards for local products and services so as to make them competitive in the international market.

Ethiopian Standards

The Ethiopian Standards are developed by national technical committees which are composed of different stakeholders consisting of educational Institutions, research institutes, government organizations, certification, inspection, and testing organizations, regulatory bodies, consumer association etc. The requirements and/ or recommendations contained in Ethiopian Standards are consensus based that reflects the interest of the TC representatives and also of comments received from the public and other sources. Ethiopian Standards are approved by the National Standardization Council and are kept under continuous review after publication and updated regularly to take account of latest scientific and technological changes.
Orders for all Ethiopian Standards, International Standard and ASTM standards, including electronic versions, should be addressed to the Documentation and Publication Team at the Head office and Branch (Liaisons) offices. A catalogue of Ethiopian Standards is also available freely and can be accessed in from our website.

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International Involvement
ESA, representing Ethiopia, is a member of the International Organization for Standardization (ISO), and Codex Alimentarius Commission (CODEX). It also maintains close working relations with the international Electro-technical Commission (IEC) and American Society for Testing and Materials (ASTM).It is a founding member of the African Regional Organization for standardization (ARSO).

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